

# Barnegat Bay Phase 1 Status and Data Update

NJDEP Water Monitoring and Standards

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12/1/2011

# Purpose of the Barnegat Bay Water Quality Monitoring Program

- ▶ Determine the location and extent of water quality impairments
- ▶ Calibrate and validate modeling tools to simulate existing water quality response and predict response under various conditions
- ▶ Based on responses to pollutant loads: Identify water quality targets to address the eutrophication stressor/response issue in Barnegat Bay
- ▶ Test management scenarios to see “what it will take” to achieve water quality targets ▶ inform path forward re: additional management responses

# Barnegat Bay Monitoring Plan Components

## ▶ Phase 1

- June-December 2011
- Grab water quality sampling
- Flow monitoring
- Continuous in-situ water quality monitoring

## ▶ Phase 2

- January 2012- ?
- Bathymetric survey
- Increased grab sample frequency
- Continuous in-situ water quality monitoring
- Sediment quality
- Two (5-day) intensive sampling events
- Flow monitoring

# Phase 1

## Monitoring Plan Components

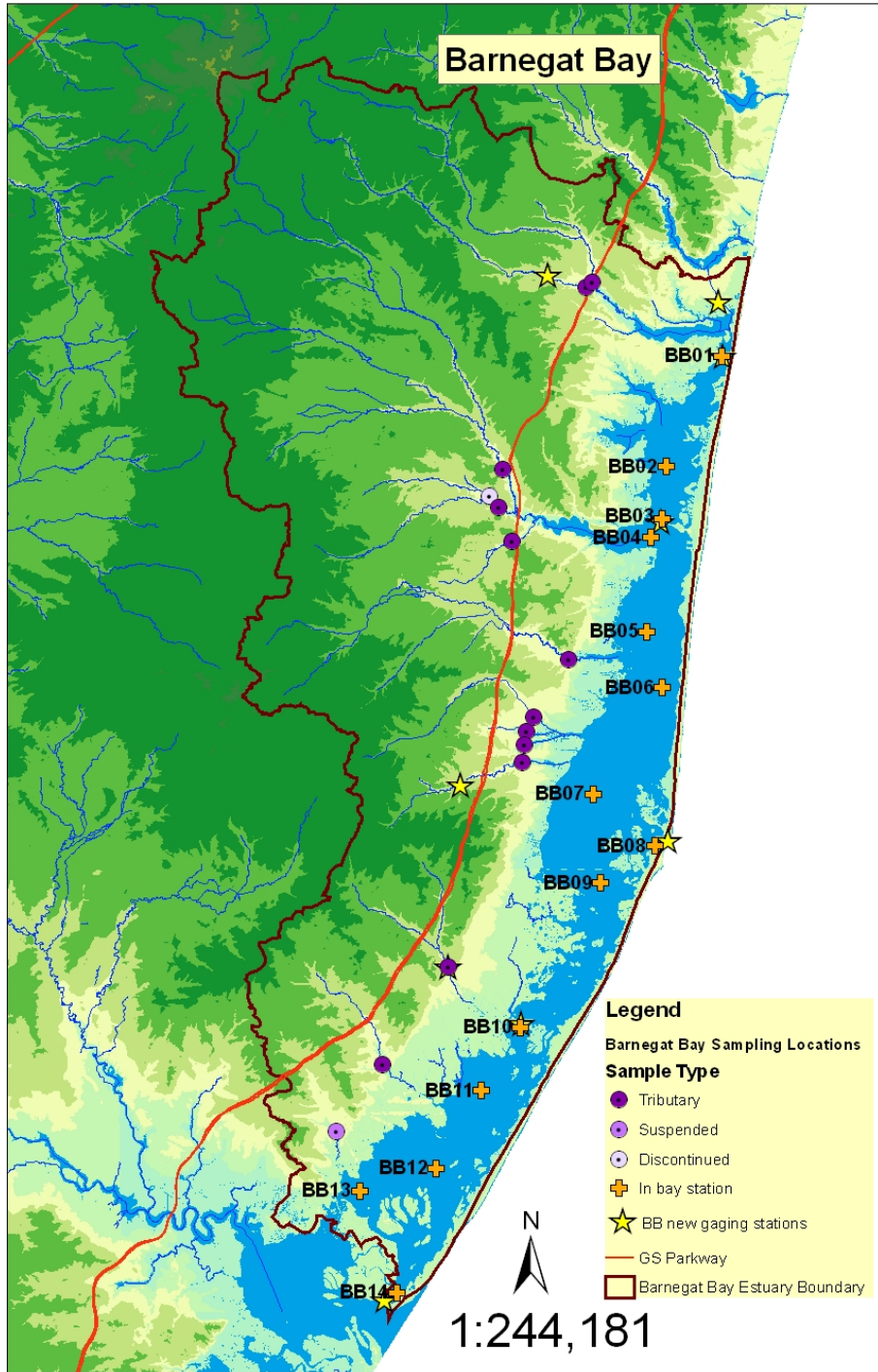
### ▶ Grab water quality sampling

- 13(12) water quality grab sample locations at major tributaries
- 14 in bay water quality grab sample locations
- Continuous WQ monitoring at Toms River gaging station

[http://waterdata.usgs.gov/nj/nwis/uv/?site\\_no=01408500&PARAMeter\\_cd=00010,00095,00300,00301,00400,63680](http://waterdata.usgs.gov/nj/nwis/uv/?site_no=01408500&PARAMeter_cd=00010,00095,00300,00301,00400,63680)

### ▶ Flow Monitoring

- Flow monitoring fresh water tributaries
- 3 new tributary flow stations in addition to 3 existing ones
- 2 bay inlet/outlet flow stations completed





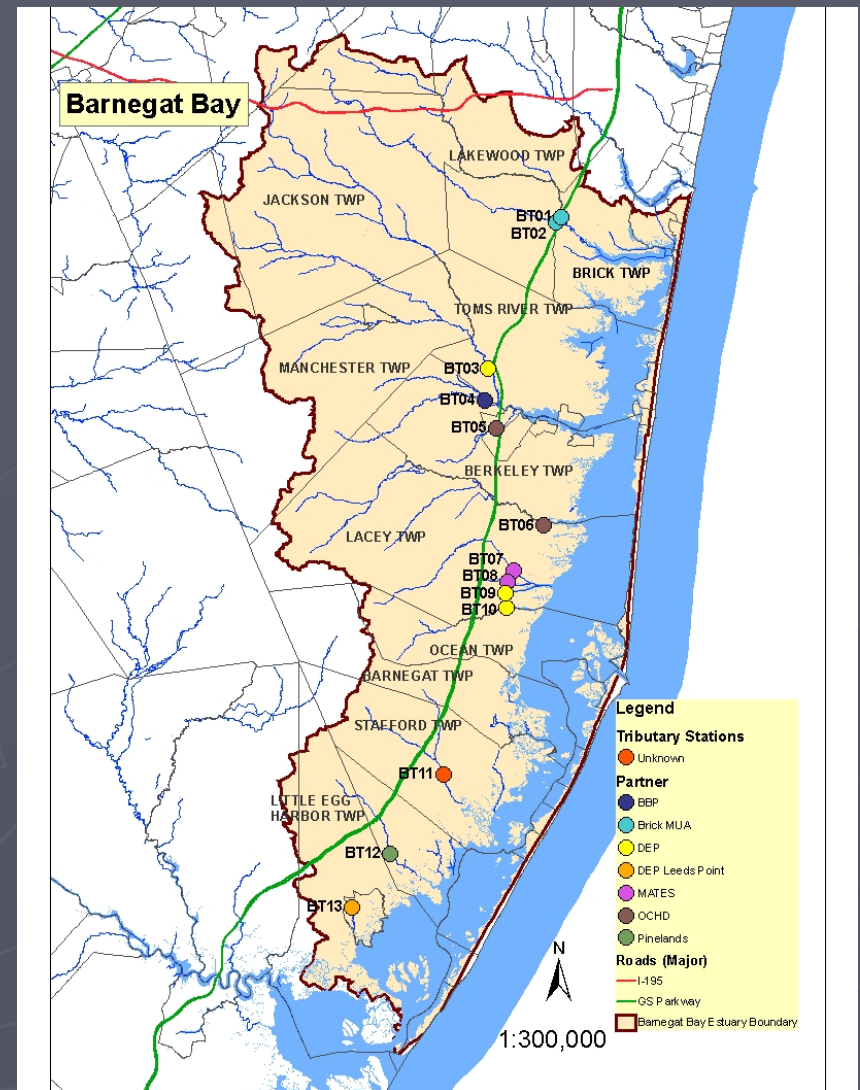


# The Partner Approach

- ▶ The sampling program utilizes the assistance of 9 partner organization
  - BBP, EPA, Brick Twp MUA, OCHD, Pinelands Commission, USGS, OCMUA, Monmouth Univ, MATES
- ▶ Water quality samples are collected and delivered to 2 field laboratories for filtration and preservation
  - LEEDS Point Laboratory
  - FREC
- ▶ Preserved samples are transported to 4 laboratories for analysis
  - Nutrients, Solids Chlorophyll-LEEDS Point
  - BOD- OCUA
  - Si, Carbon (FW) Alkalinity-EPA Edison
  - Carbon(SW)- Maryland University Laboratory

# Freshwater Tributaries Stations BT1-BT13

- ▶ 13(12) Water Quality Stations
  - Field Parameters-
    - ▶ Temp, DO, DO Sat, pH, Specific Conductance, Turbidity
  - Laboratory Parameters-
    - ▶ TSS, BOD5, CBOD5, CBOD20, Dissolved and Total Nutrients, Alkalinity, Silica, TOC, DOC

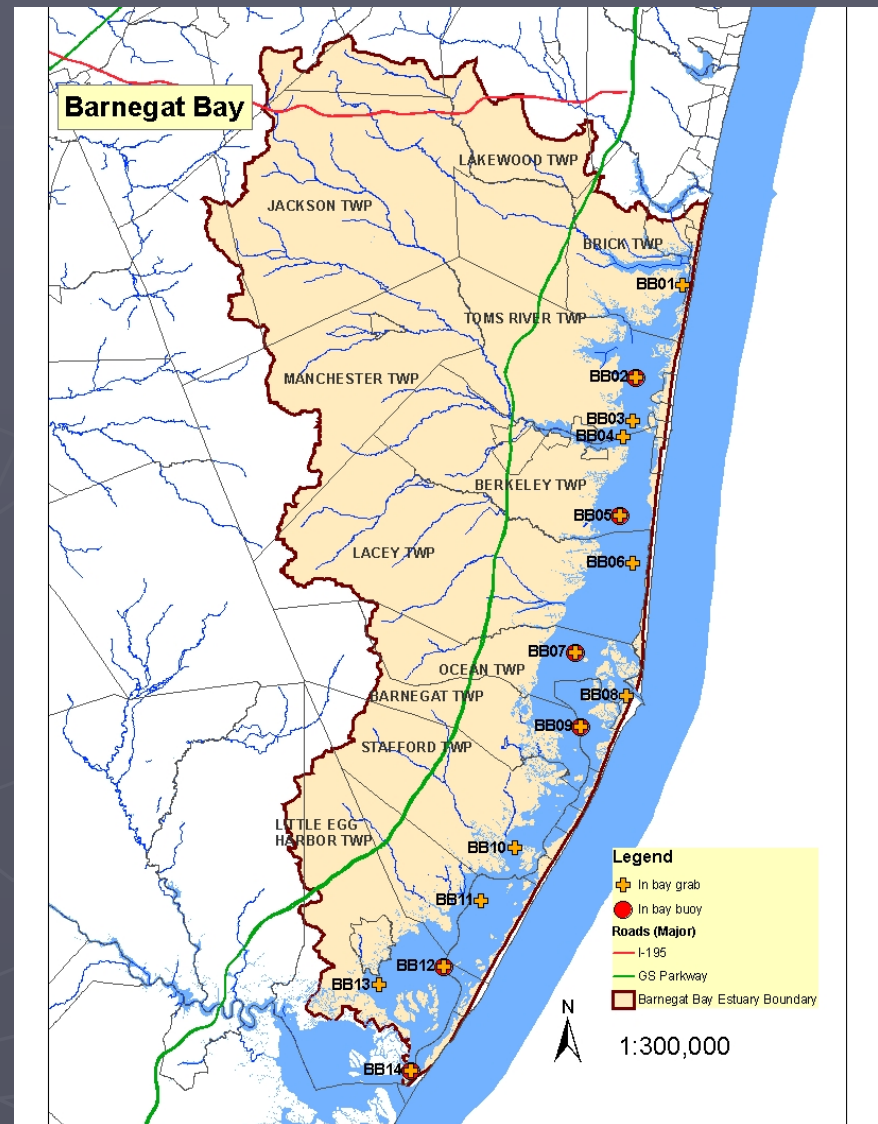




# In Bay Stations BB01-BB14

## ▶ 14 Water Quality Stations

- Field Parameters-
  - ▶ Temp, DO, DO Sat, pH, Specific Conductance, Turbidity, Transmissionmetry, Salinity, Secchi Depth
- Laboratory Parameters
  - ▶ TSS, Chlorophyll a, BOD5, CBOD5, CBOD20, Dissolved and Total Nutrients, Alkalinity, Silica, TOC, DOC



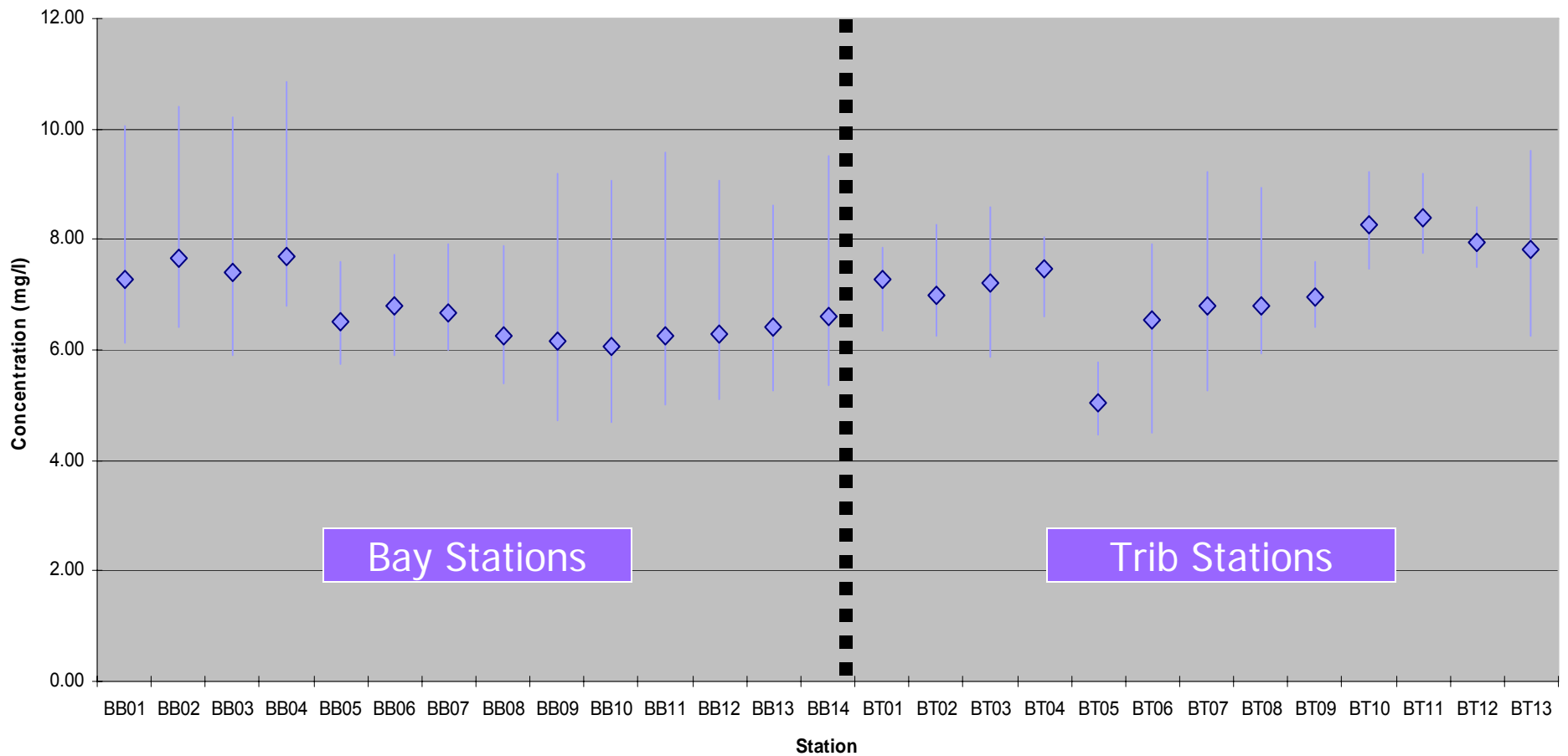
# Phase 1 Status

## ▶ Phase 1 -June-December 2011

- Grab water quality sampling
  - ▶ 11 sampling events completed to date
  - ▶ 1 more event scheduled to complete phase 1
  - ▶ Next event scheduled for 12/8/2011
- Macroinvertebrate monitoring has been added to tributaries
  - ▶ 11 of 13 monitoring locations
- Flow monitoring
  - ▶ All 3 new tributary gage stations built and running
  - ▶ Toms River
    - Continuous water quality installed
    - nitrate probe in progress
  - ▶ Inlet/Outlet Bay flow monitoring stations

# Phase 1 Data - Dissolved Oxygen (Min/Max/Avg)

Barnegat Bay Ambient Monitoring Program Dissolved Oxygen (6/6/2011-10/13/11)





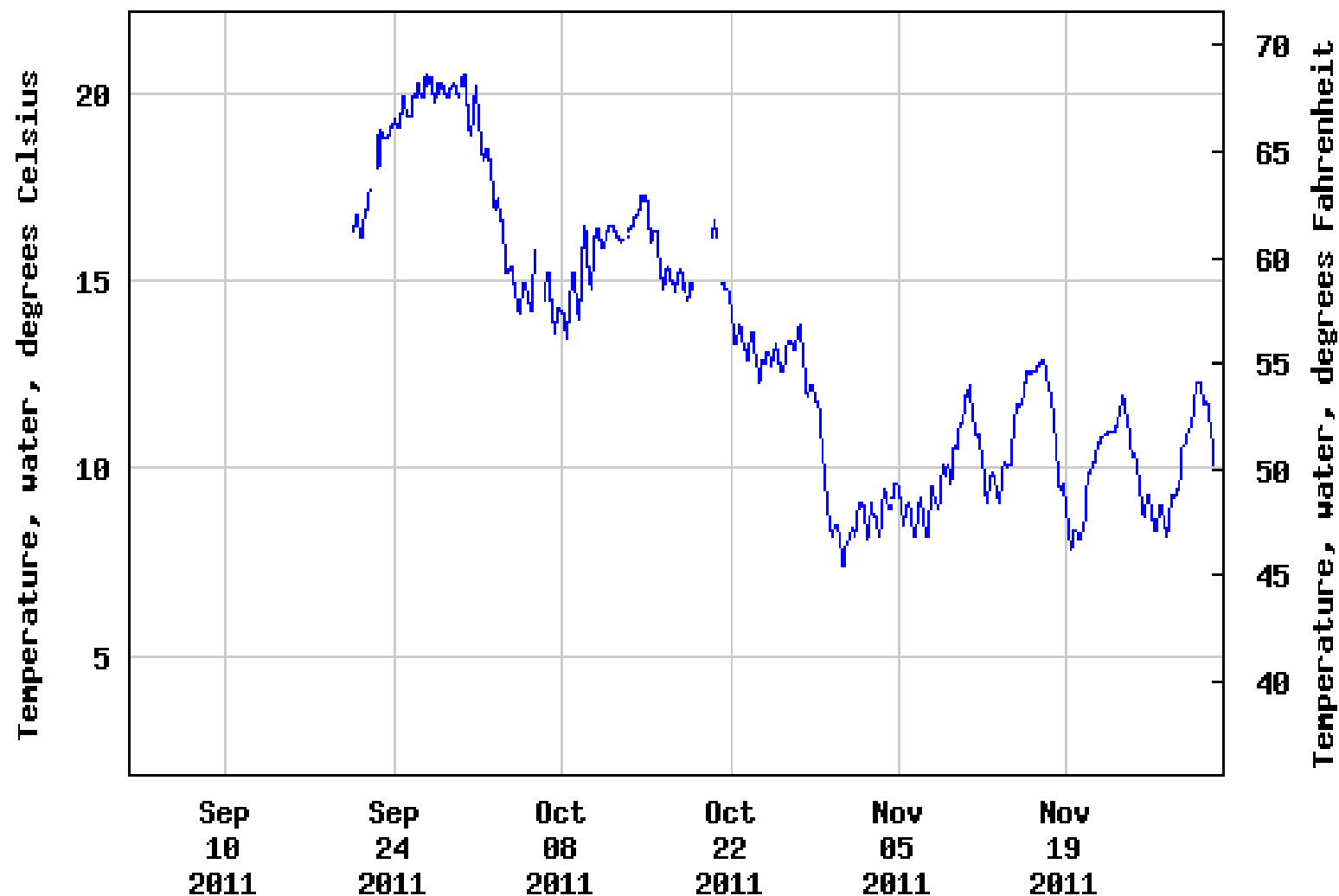
## USGS 01408500 Toms River near Toms River NJ



----- Provisional Data Subject to Revision -----



### USGS 01408500 Toms River near Toms River NJ

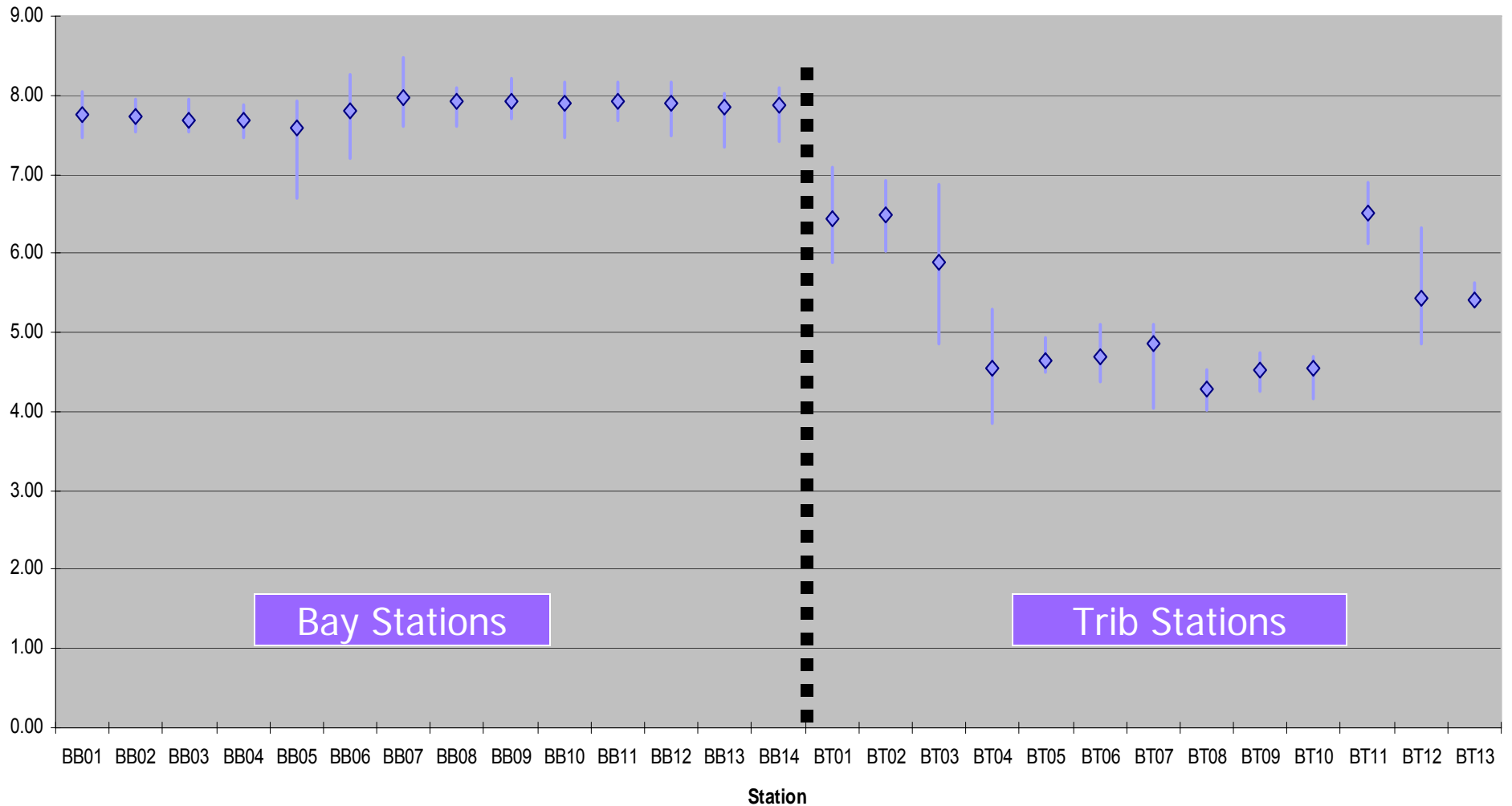


----- Provisional Data Subject to Revision -----



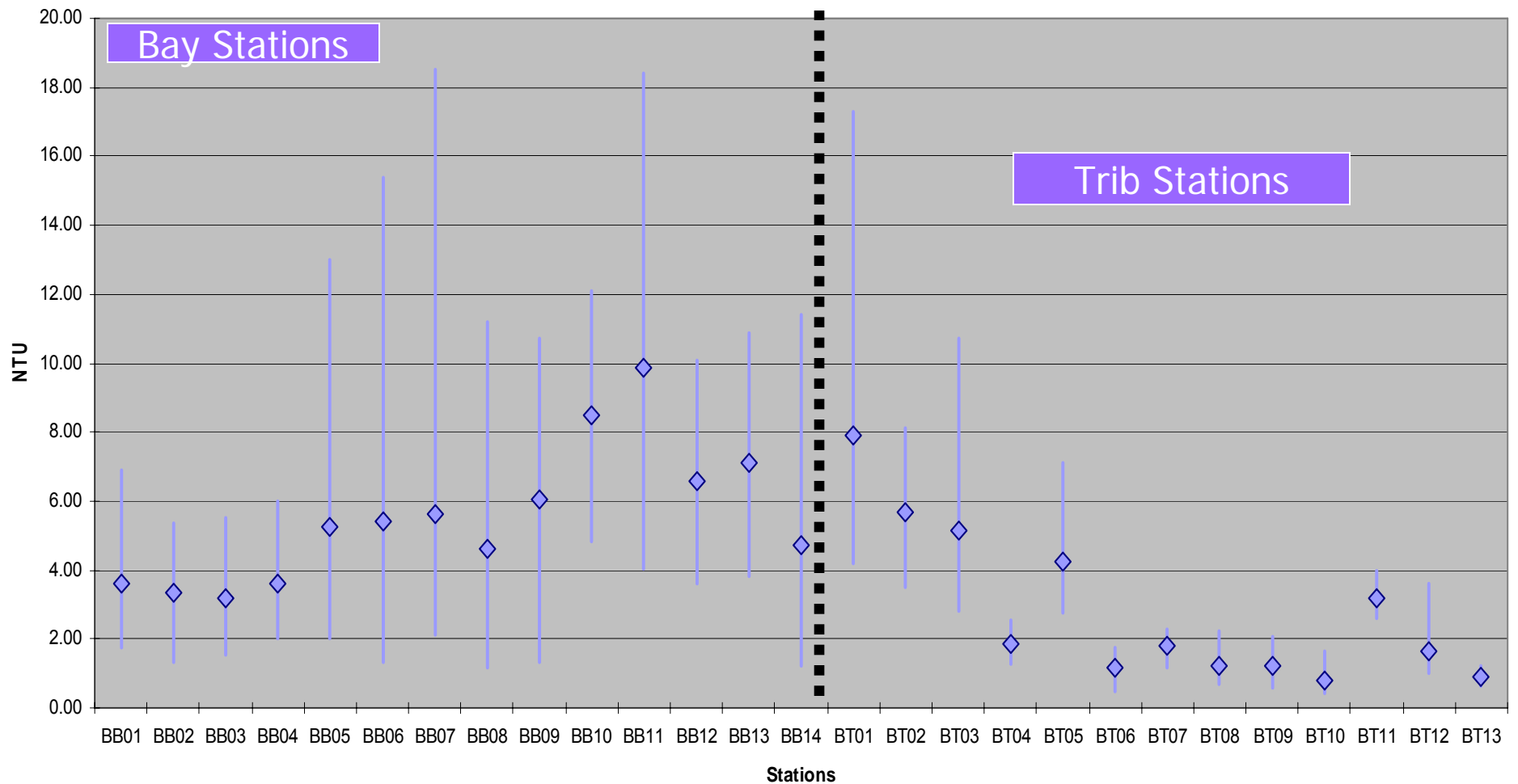
# Phase 1 Data - pH (Min/Max/Avg)

Barnegat Bay Ambient Monitoring Program pH (6/6/2011-10/13/11)



# Phase 1 Data - Turbidity (Min/Max/Avg)

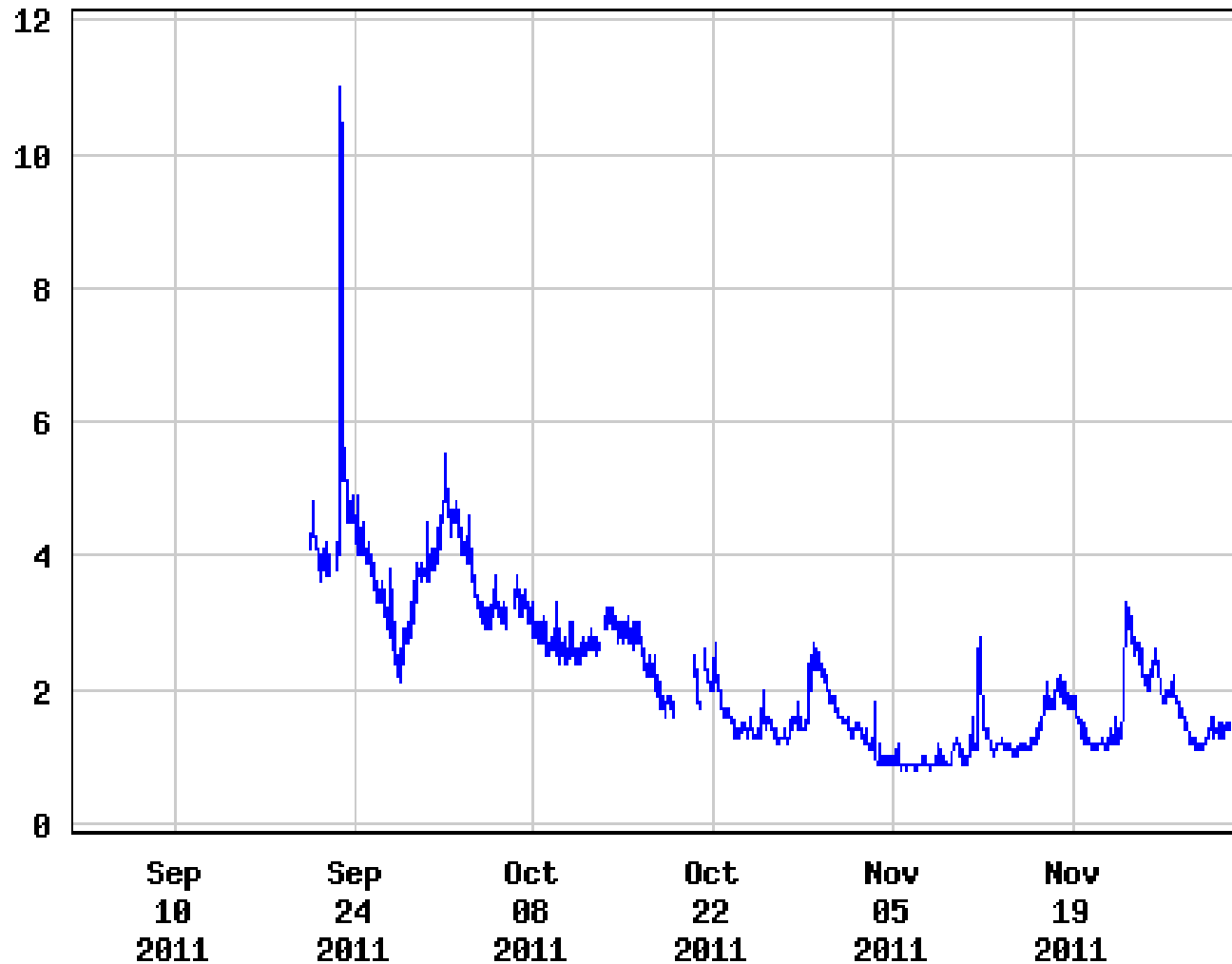
Barnegta Bay Ambient Monitoring Program Turbidity





## USGS 01408500 Toms River near Toms River NJ

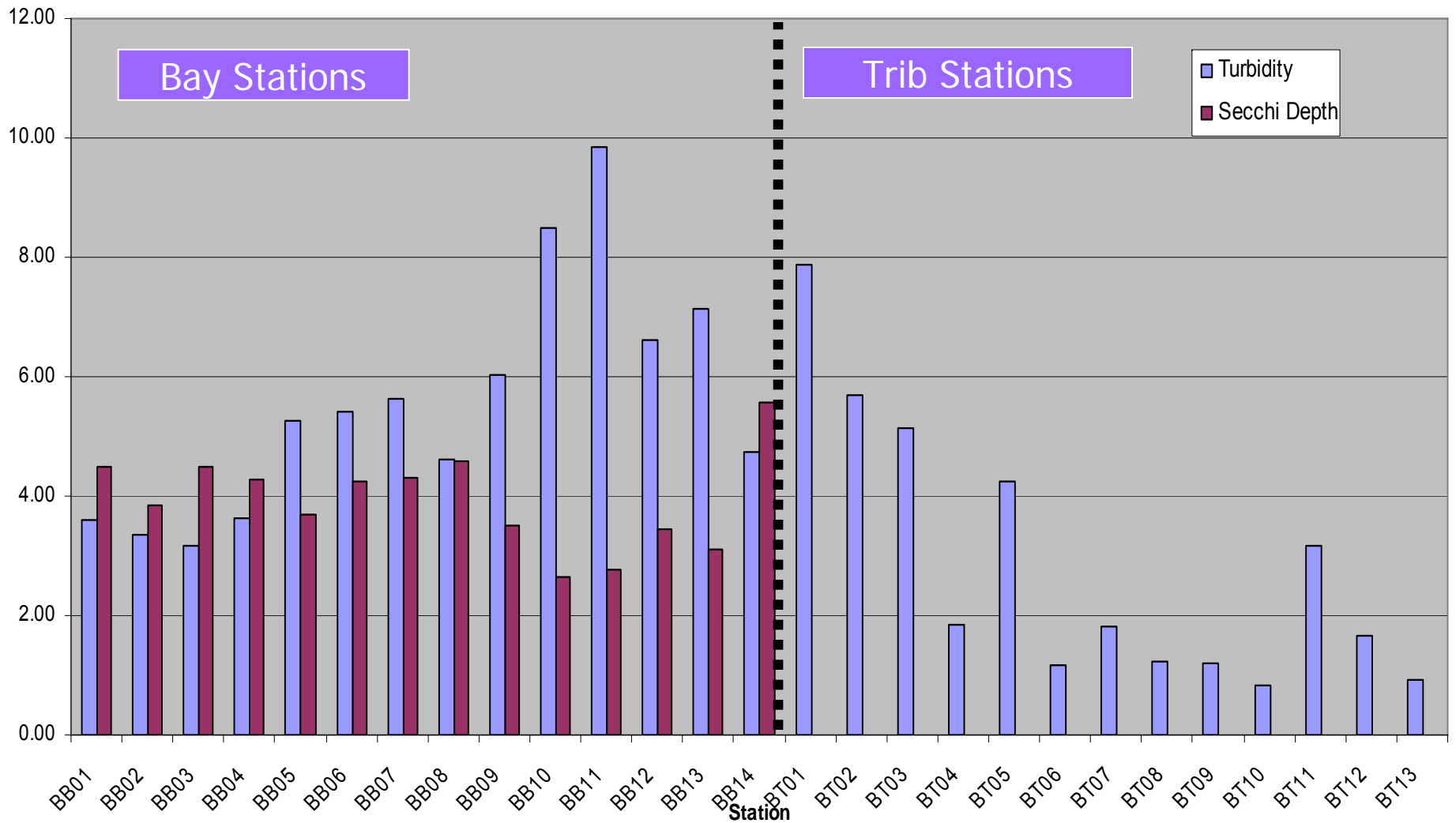
Turbidity, water, unfiltered,  
monochrome near infra-red LED light,  
780-900 nm, detection angle 90 +/- 2.5  
degrees, formazin nephelometric units  
(FNU)



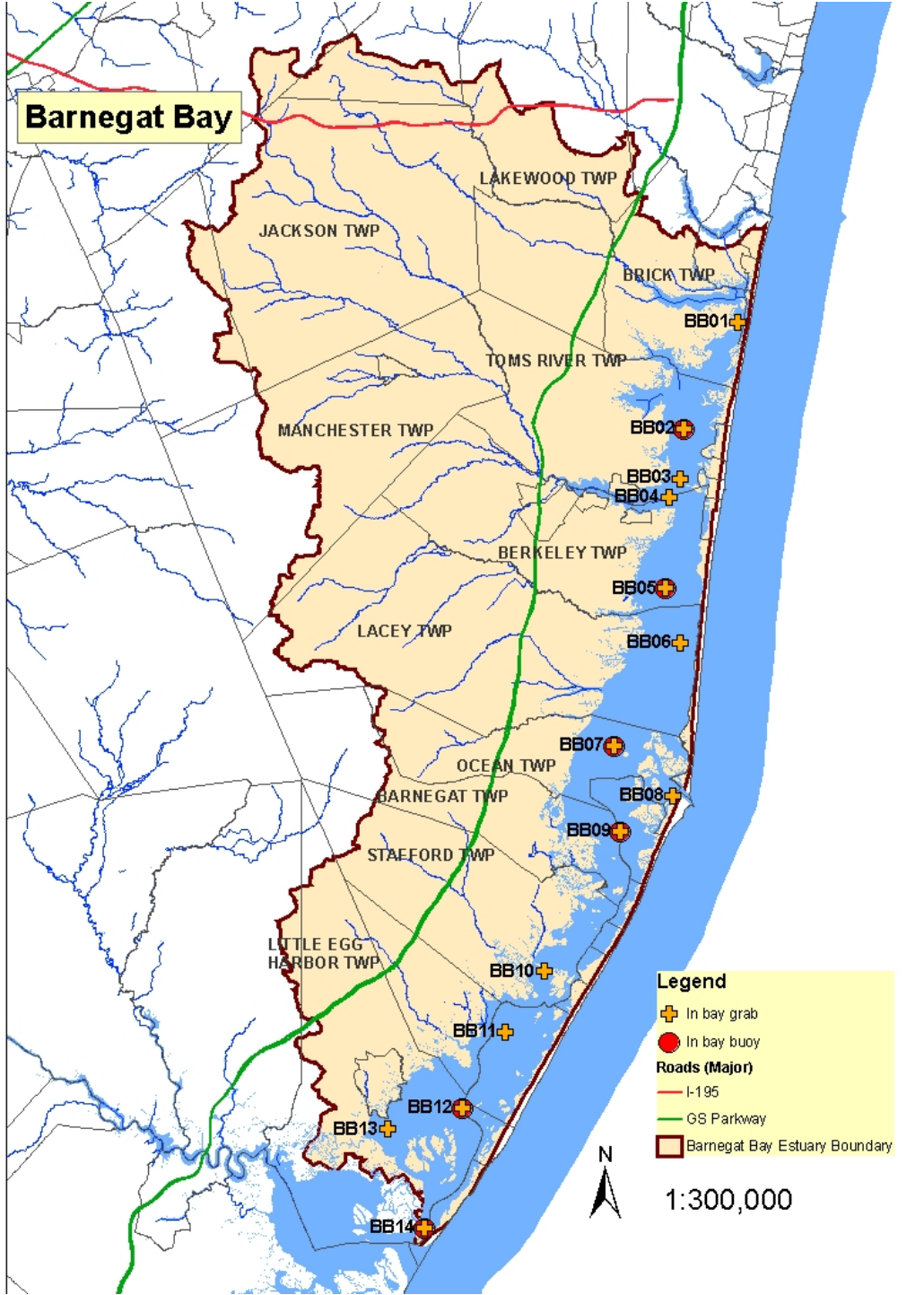
---- Provisional Data Subject to Revision ----

# Phase 1 Data – Average Turbidity and Secchi Depth

Barnegat Bay Ambient Monitoring Program Average Turbidity and Average Secchi Depth (6/6/11-10/13/11)



# Barnegat Bay



### Legend

- Orange cross: In bay grab
- Red circle: In bay buoy
- Roads (Major): I-195
- Green line: GS Parkway
- Orange outline: Barnegat Bay Estuary Boundary

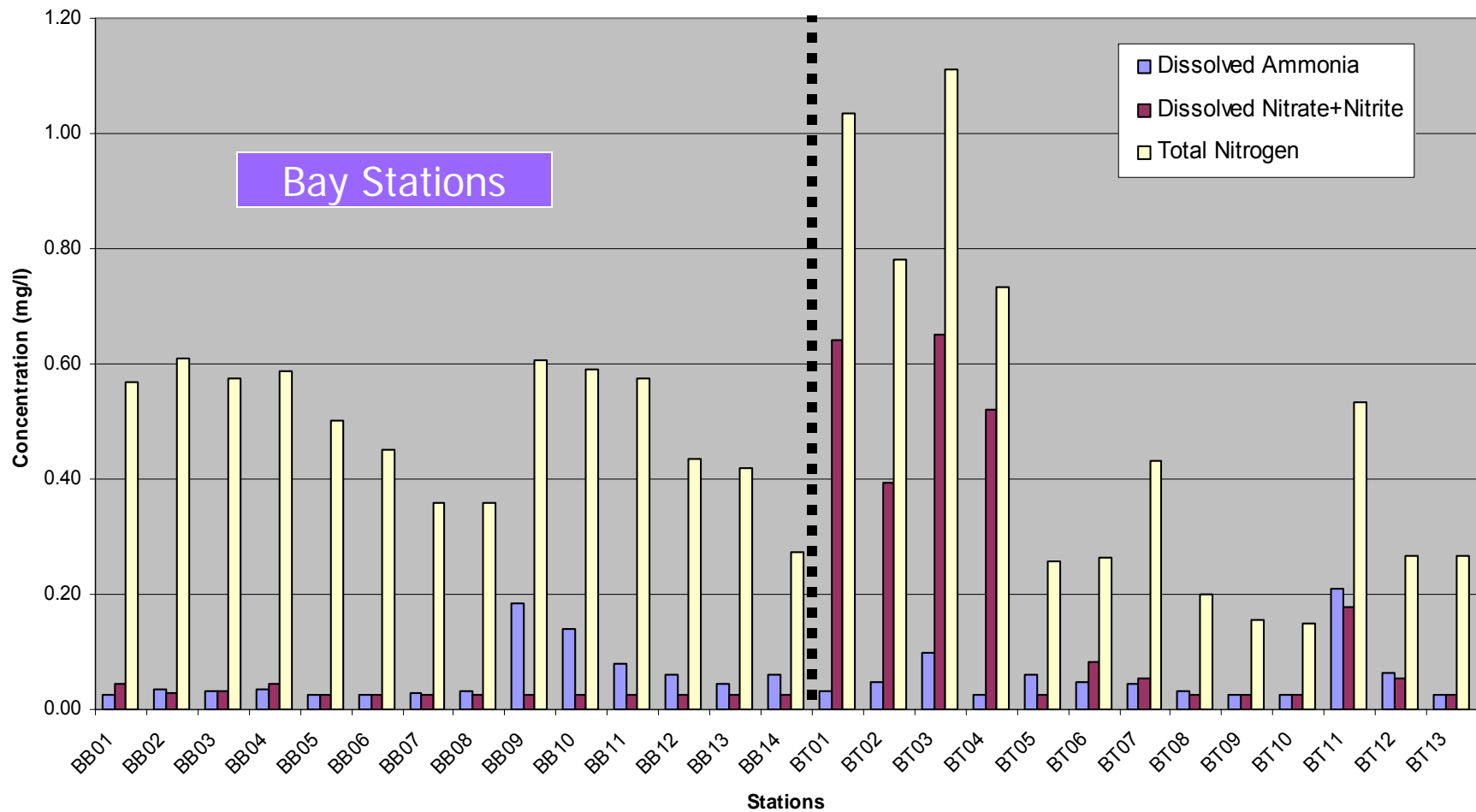


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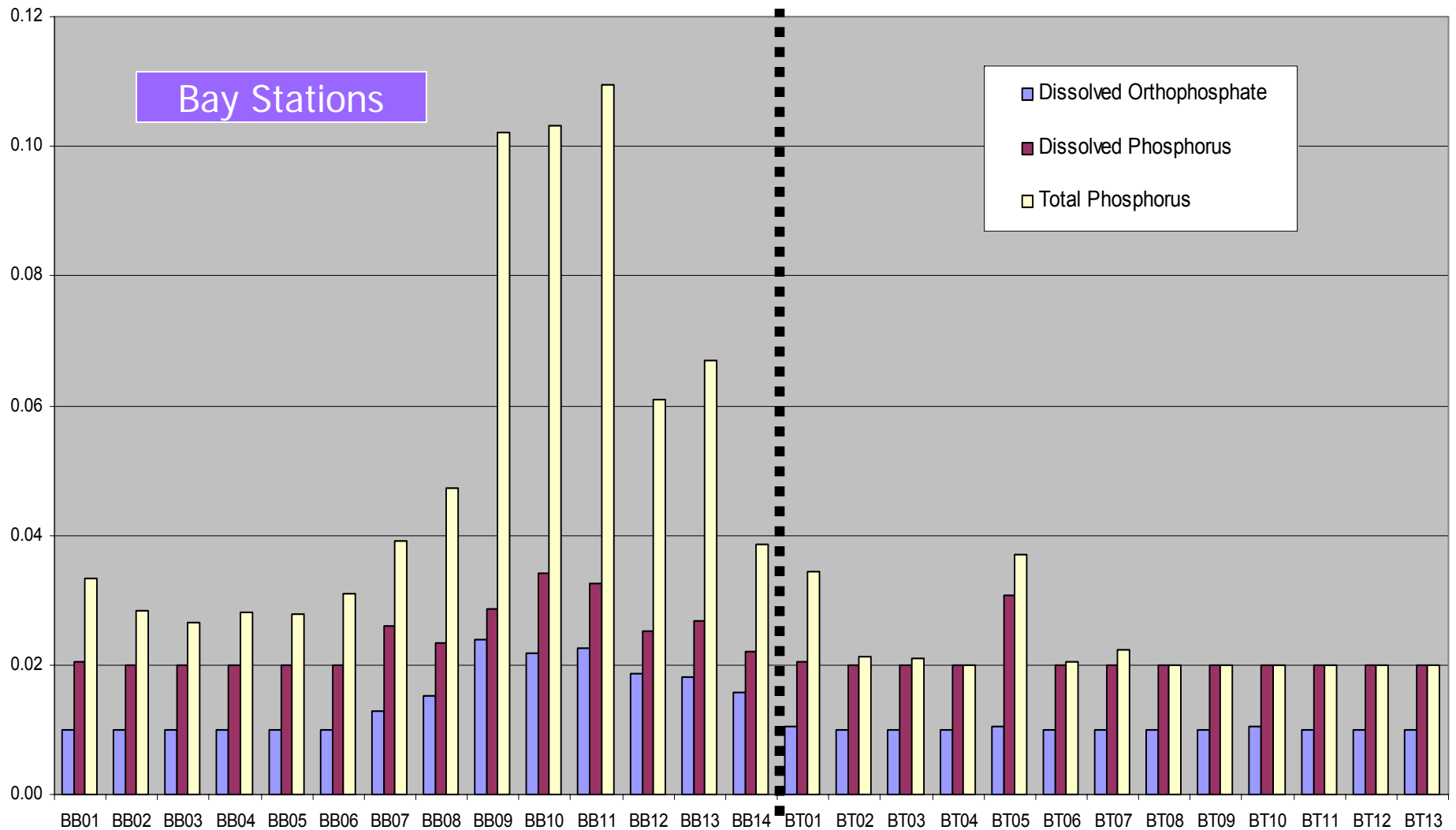


# Average Nitrogen Concentrations June-September 2011

Barnegat Bay Ambient Monitoring Program Nitrogen (6/6/11-9/26/11)

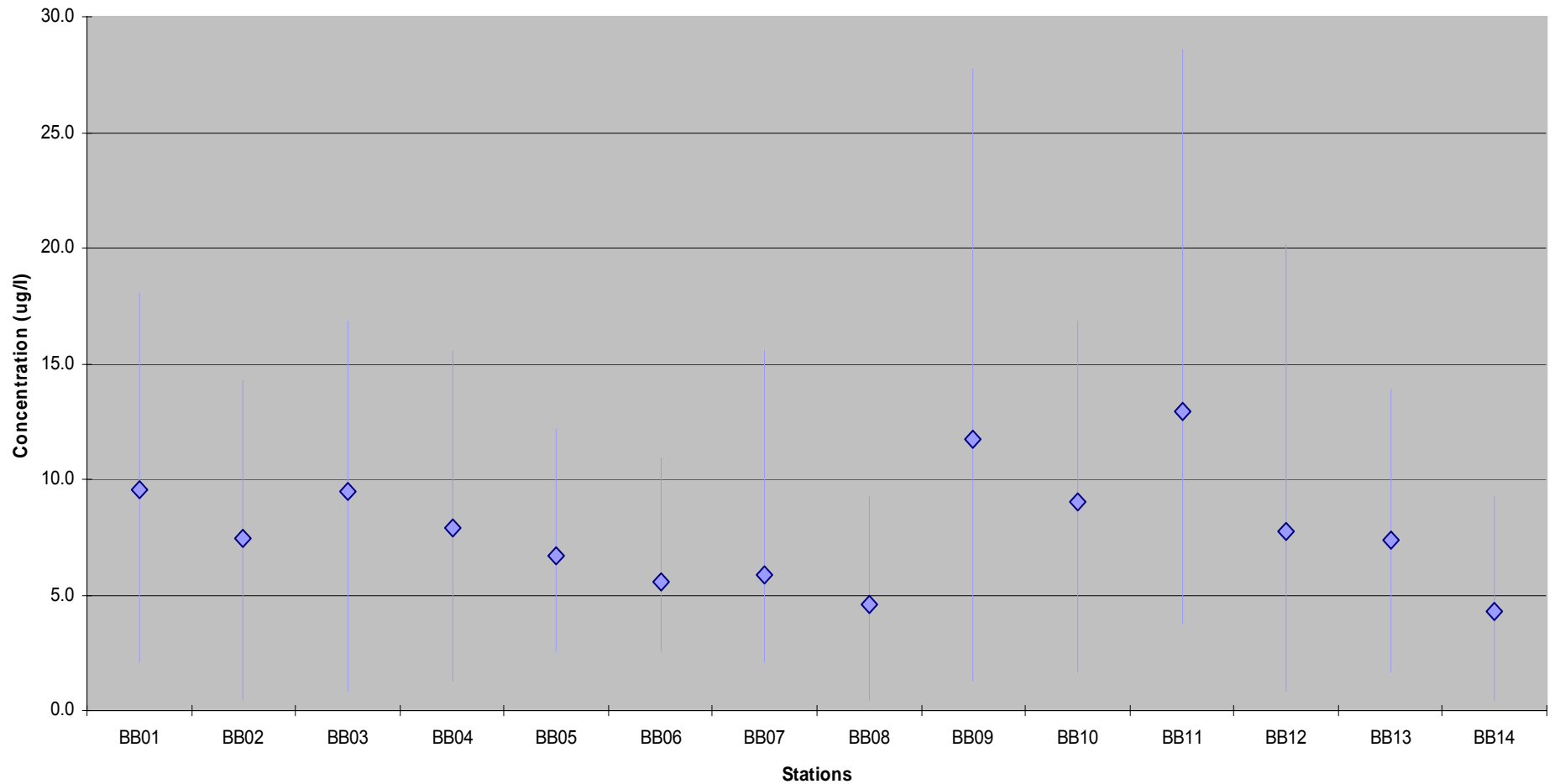


# Average Phosphorus Concentrations June-September 2011

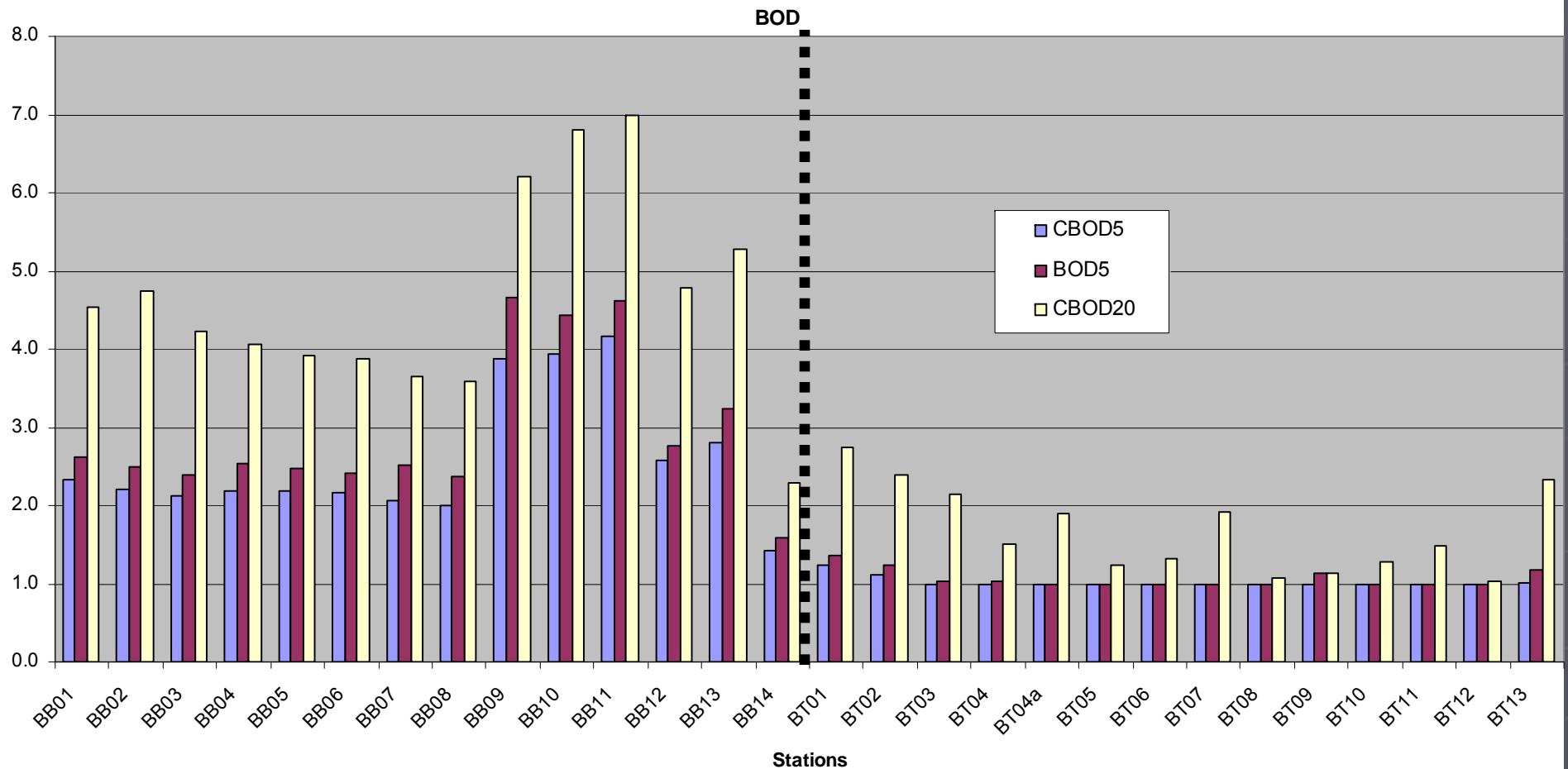


# Chlorophyll a

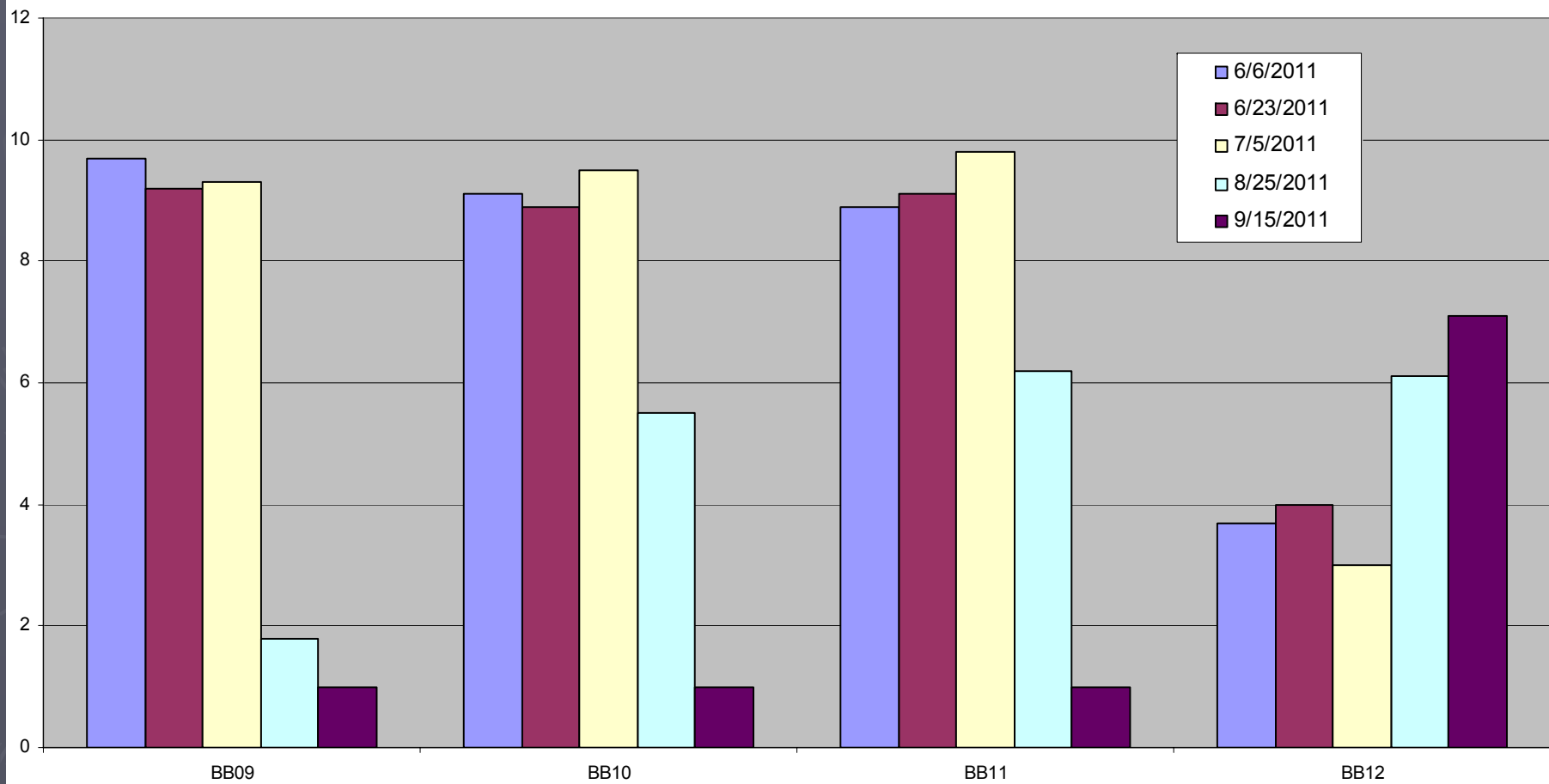
Barnegat Bay Monitoring Program Chlorophyll a (6/6/2011-9/26/2011)



# Average BOD at All Stations

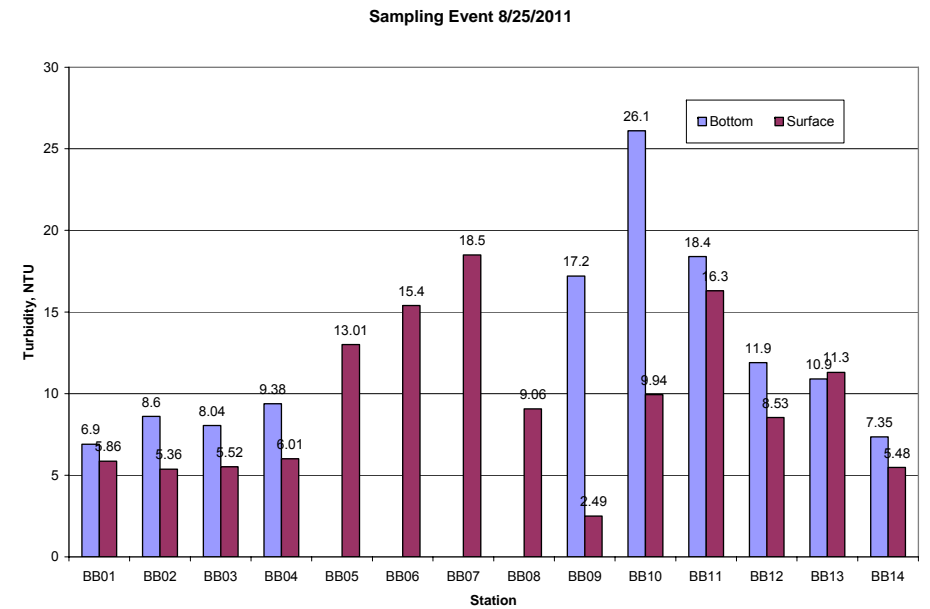
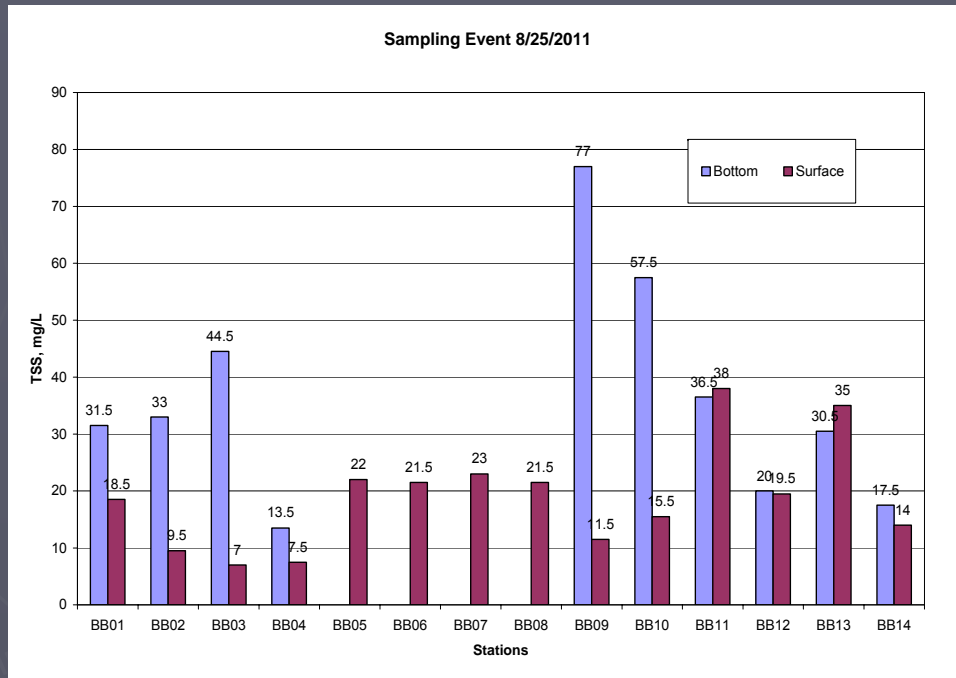


# CBOD20 for BB09-BB12



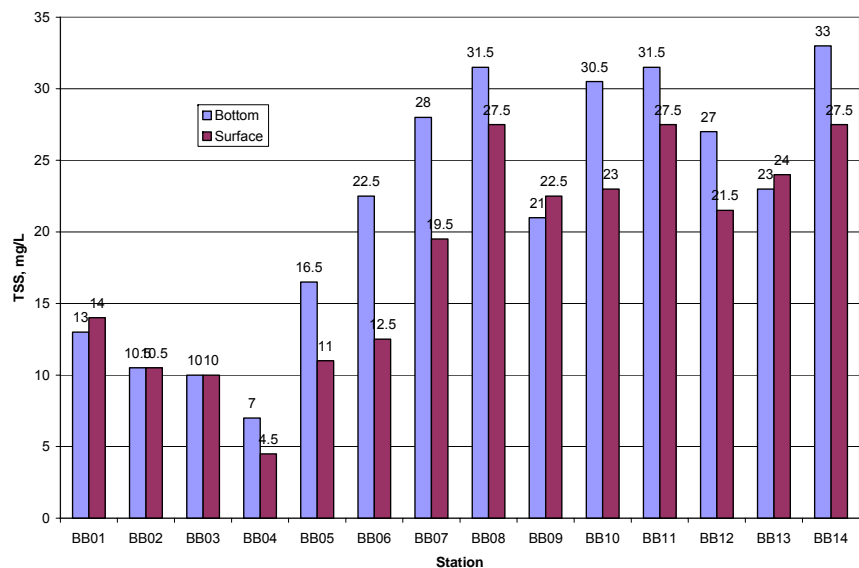


# Surface vs Bottom: 8/25/2011

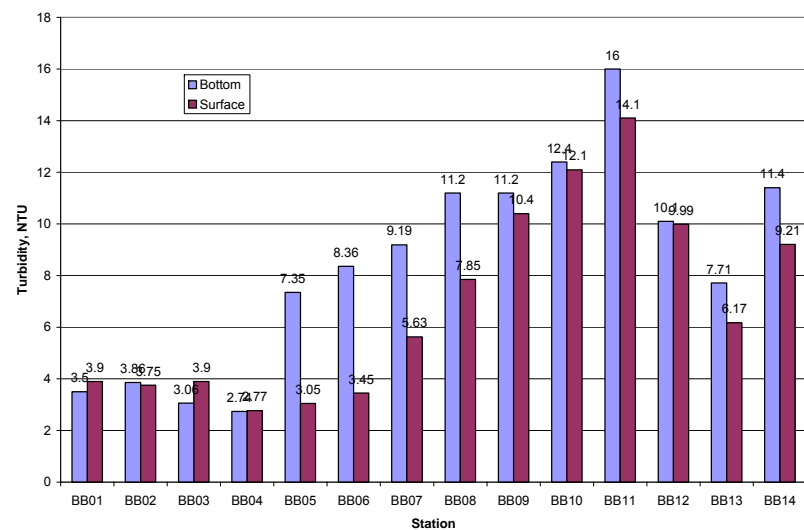


# Surface vs Bottom: 9/15/2011

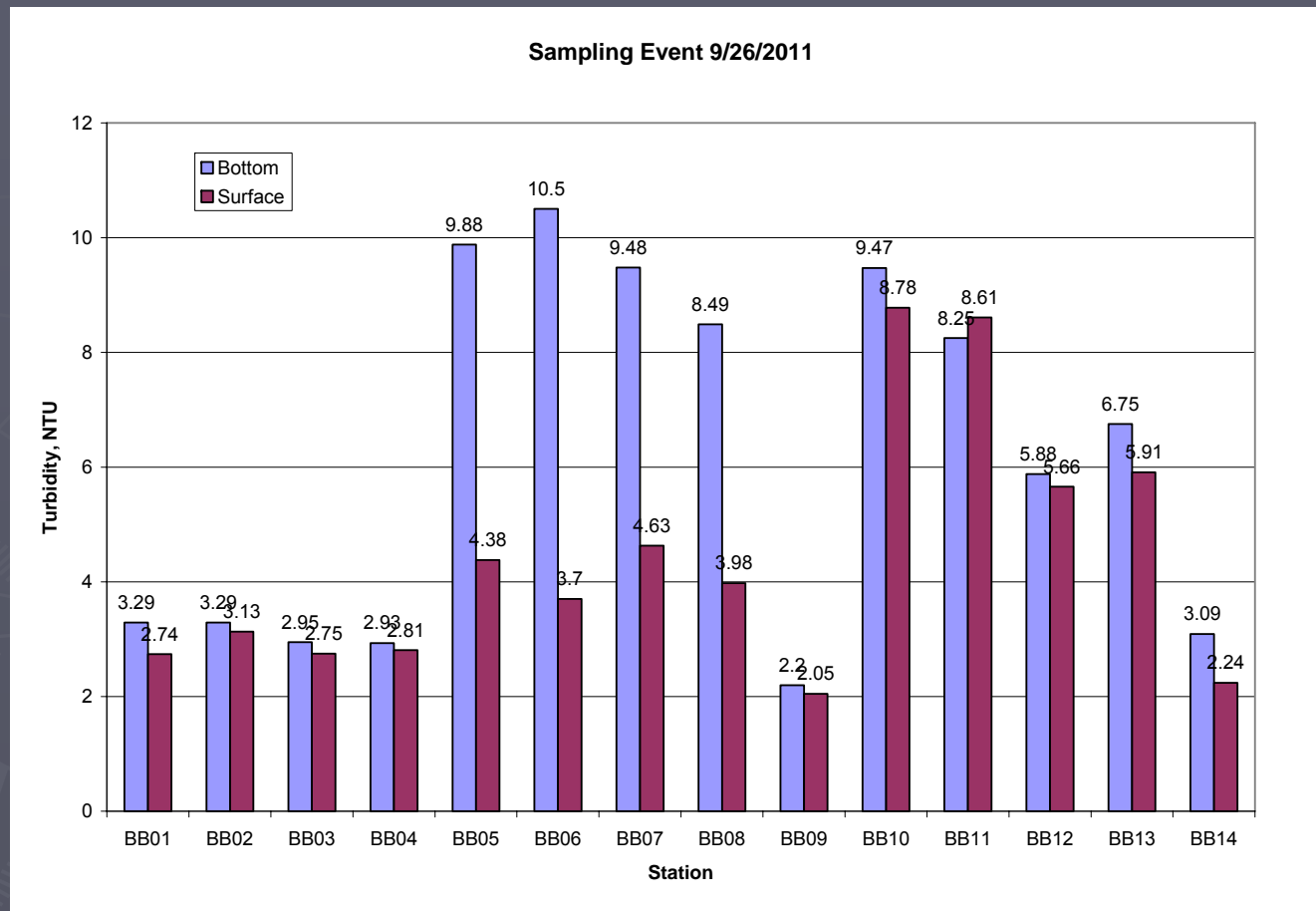
Sampling Event 9/15/2011



Sampling Event 9/15/2011



# Surface vs Bottom: 9/26/2012



# BT Sites Sampled To Date For Macroinvertebrates

BT #	Stream	Date of macro sample	2011 rating	Closest AMNET SITE	AMNET 2010 rating
BT01	North Branch Metedeconk River			AN0506	Fair
BT02	South Branch Metedeconk River	9/15/11		AN0512	Fair
BT03	Toms River			AN0535	Fair
BT04a	Wrangle Brook	9/15/11		none	
BT05	Jakes Branch			AN0543	Fair
BT06	Cedar Creek	8/25/11	Good	AN0549	Excellent
BT07	North Branch Forked River			none	
BT08	Middle Br	8/25/11	Fair	none	
BT09	South Br Forked River	8/25/11	Excellent	none	
BT10	Oyster Creek	8/25/11	Good	none	
BT11	Mill Ck			AN0555	Poor
BT12	Westecunk Creek			AN0558	Excellent
BT13	Tuckerton Creek			none	

# Accomplishments to Date

- ▶ 11 Sampling Events
- ▶ 297 Samples taken
- ▶ 1272 bottles dropped off at FREC or Leeds
- ▶ 2857 Field measurements taken
- ▶ 3351 bottles filtered and unfiltered sent to 4 laboratories



# Thank You !!!

